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(54) 【発明の名称】 樹脂板用表面保護フィルム

(57) 【要約】

【目的】 効果的に合成樹脂板の帯電を防止でき、かつ貼付使用中の粘着性能の経時変化のない樹脂板用表面保護フィルムを提供することにある。

【構成】 ポリオレフィン系熱可塑性樹脂及びポリエーテルエステルアミド樹脂からなる基材フィルムの片面に、酢酸ビニル含量が5～30重量%のエチレン-酢酸ビニル共重合体からなる粘着剤が積層されていることを特徴とする樹脂板用表面保護フィルム。

【特許請求の範囲】

【請求項1】 (A) ポリオレフィン系熱可塑性樹脂100重量部および(B) 分子内にアミド基および/またはイミド基を有するポリエーテル系樹脂5〜30重量部からなる基材フィルムの片面に、酢酸ビニル含量が5〜30重量%のエチレン-酢酸ビニル共重合体からなる粘着剤が積層されていることを特徴とする樹脂板用表面保護フィルム。

【請求項2】 ポリエーテル系樹脂が、ポリエーテルエステルアミド樹脂またはポリエーテルアミドイミド樹脂であることを特徴とする請求項1記載の樹脂板用表面保護フィルム。

【発明の詳細な説明】

【0001】

【産業上の利用分野】 本発明は、樹脂板用表面保護フィルムに関する。

【0002】

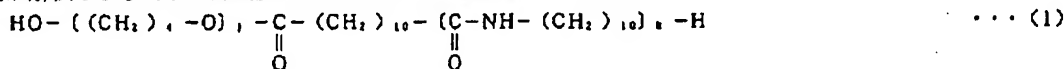
【従来の技術】 これまで、合成樹脂板、化粧板、金属板等の表面への塵や埃の付着といった汚染防止や加工時および運搬時の損傷等を防止する目的で、ポリエチレン、ポリプロピレン等のポリオレフィン系樹脂フィルムの片面に粘着剤を積層してなる表面保護フィルムを仮貼付する方法が知られている。

【0003】 しかしながら、上記表面保護フィルムを合成樹脂板に貼付後、搬送または積み重ねられた場合の摩擦により、上記表面保護フィルムと合成樹脂板のいずれも高い絶縁性を有する為に、特に冬季等の乾燥雰囲気下において静電気を帯び易く、この結果、電撃の発生や塵埃の吸着のみならず、合成樹脂板同士の吸引や反発により作業性が低下するという問題点があった。

【0004】 上記問題点を解決する方法として、例えば、ポリオレフィン系熱可塑性樹脂に界面活性剤を添加混合した後成形したフィルムを基材として用いた表面保護フィルムが開示されている(特開平4-292943号公報)。

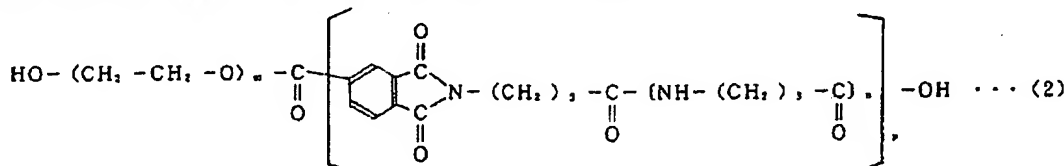
【0005】

【発明が解決しようとする課題】 しかしながら、上記公*



(j, kはそれぞれ1以上の整数を示す。)

【0012】 上記ポリエーテルアミドイミド樹脂としては、ポリエーテルを主鎖とし、分子内にアミド基およびイミド基の両方を含有する化合物であり、具体的には、



*報記載の表面保護フィルムを用いた場合でも、添加される界面活性剤量に制限があり、充分に満足する帯電防止性が得られず、また充分に満足する帯電防止性を得ようと多量の界面活性剤を添加すると、貼付使用中に界面活性剤が粘着剤にブリードアウトすることによる粘着力低下や剥離後の被着体汚染といった粘着性能の経時変化に関する問題点があった。

【0006】 本発明の目的は、合成樹脂板の帯電の防止機能を充分に満足させることができ、かつ貼付使用中の粘着性能の経時変化のない樹脂板用表面保護フィルムを提供することにある。

【0007】

【課題を解決するための手段】 本発明に用いられる基材フィルムは、ポリオレフィン系熱可塑性樹脂(A)およびポリエーテル系樹脂(B)からなる。

【0008】 上記ポリオレフィン系熱可塑性樹脂(A)としては、例えば、低密度ポリエチレン、直鎖状低密度ポリエチレン、中密度ポリエチレン、高密度ポリエチレン、エチレン-αオレフィン共重合体、プロピレン-αオレフィン共重合体、エチレン-エチルアクリレート共重合体、エチレン-酢酸ビニル共重合体、エチレン-メチルメタクリレート共重合体、ポリプロピレン等が挙げられる。これらは単独で用いても、また2種類以上混合して用いてもよい。

【0009】 上記ポリエーテル系樹脂(B)は、分子内にアミド基および/またはイミド基を有するポリエーテル系樹脂であり、例えば、ポリエーテルエステルアミド樹脂、ポリエーテルアミドイミド樹脂等が挙げられる。

【0010】 上記ポリエーテルエステルアミド樹脂としては、ε-カプロラクタムおよび3-イソフタル酸のアルカリ金属塩から誘導される両末端にカルボキシル基を有するポリアミドと、ビスフェノール類のアルキレンオキシド付加物から誘導されるものであり、具体的には、下記一般式(1)で表されるものの他、それらの誘導体等が挙げられる。

【0011】

【化1】

下記一般式(2)で表されるものの他、それらの誘導体等が挙げられる。

【0013】

【化2】

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(m, n, pはそれぞれ1以上の整数を示し、また、
m:pは3:7~7:3である)

【0014】上記ポリエーテル系樹脂(B)の重量平均分子量は、小さくなるとシート of の凝集力を低下させ、また大きくなると柔軟性を損なうため、5,000~200,000が好ましく、より好ましくは10,000~100,000である。

【0015】上記ポリエーテル系樹脂(B)の添加量は、少なくなると充分な帯電防止性が得られにくくなり、また多くなっても一定の帯電防止性しか得られず、生産性が低くなるという理由から、上記ポリオレフィン系熱可塑性樹脂(A)100重量部に対し5~35重量部であり、好ましくは15~25重量部である。

【0016】本発明に用いられる基材フィルムの必須成分は上記の通りであるが、上記必須成分以外に紫外線吸収剤等の光安定剤、酸化防止剤、充填材等が必要に応じて添加されてもよい。

【0017】上記基材フィルムの厚みは、用途により適宜選択されるが、使い易さという点で10~80μmが好ましい。

【0018】本発明の樹脂板用表面保護フィルムは、上記基材フィルムの片面にエチレン-酢酸ビニル共重合体からなる粘着剤を積層することにより得られる。

【0019】上記エチレン-酢酸ビニル共重合体中の酢酸ビニル含量は、少なくなると上記樹脂板用表面保護フィルムの被着体への接着性が得られずに浮きや剥がれが発生しやすくなり、また多くなると使用後の被着体との再剥離性が得られにくくなる為、5~30重量%であり、好ましくは10~20重量%である。

【0020】上記粘着剤には、粘着付与樹脂、軟化剤、紫外線吸収剤、酸化防止剤等が必要に応じて添加されてもよい。

【0021】上記粘着剤の厚みは、用途により適宜選択されるが、使い易さという点で5~30μmが好ましい。

【0022】本発明の樹脂板用表面保護フィルムの製造方法は特に限定されるものではなく、例えば、熱溶解後に押出成形した上記基材フィルムに上記粘着剤の溶液を塗工後乾燥してもよいし、上記基材フィルムの構成成分と上記粘着剤とをインフレーション法、Tダイ法等の熱溶解方式を用いた2層共押出法により一括成形してもよい。

【0023】本発明の表面保護フィルムが好適に貼付される樹脂板としては、例えば、ポリカーボネート樹脂板、アクリル樹脂板、塩化ビニル樹脂板、オレフィン樹脂板、ABS樹脂板等が挙げられ、この他に、これらを熔融混合した混合樹脂、あるいは多層に積層した複合樹脂でもよい。

【0024】

【作用】本発明で用いられる基材フィルムは、ポリオレ

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フィン系熱可塑性樹脂に、分子内にアミド基および/またはイミド基に由来するカルボニル基を有するポリエーテル系樹脂を特定量含有したものである、カルボニル基の酸素原子の不対電子対に空気中の水分が配位し易く、樹脂板用表面保護フィルムとした場合帯電防止性に優れ、かつ粘着剤へのブリードアウトが少ない為に粘着性能の経時変化がないものとなっている。また、エチレン-酢酸ビニル共重合体からなる粘着剤を用いていることから、合成樹脂板に対する粘着性が良好なものとなっている。

【0025】

【実施例】以下本発明の実施例について説明する。尚、以下「部」とあるのは「重量部」を意味する。

(実施例1~5および比較例1~2)表1に示した配合組成に従って、まずポリプロピレン(三菱化成工業社製、商品名「1501F」)100部に対し、ポリプロピレンとポリエーテルエステルアミド樹脂が70:30で混合された熔融混合樹脂(三洋化成工業社製、商品名「ベレスタットPP-3170」、以下「ベレスタット」とする)を添加することにより均一混練物を得た。

【0026】また、エチレン-酢酸ビニル共重合体中の酢酸ビニル含量が、19重量%の「EVA FLEX #460」(商品名、三井デュボンポリケミカル社製、以下「EVA-19」とする)、28重量%の「EVA FLEX #280」(商品名、三井デュボンポリケミカル社製、以下「EVA-28」とする)および7重量%の「ウルトラセン537」(商品名、東ソー(株)社製、以下「EVA-7」とする)を粘着剤として用いた。

【0027】上記均一混練物と上記粘着剤をTダイ法により共押出しすることによりポリオレフィン系の基材フィルム厚み60μm、エチレン-酢酸ビニル共重合体の粘着剤厚み10μmの表面保護フィルムを得た。

【0028】(実施例6~10および比較例3~4)表2に示した配合組成に従って、まずポリプロピレンおよび前述の一般式(2)で示されるポリエーテルアミドイミド樹脂(重量平均分子量5万、m:p=5:5、n=5~15)を熔融混合することにより均一混練物を得た。

【0029】また、実施例1~5および比較例1~2で使用したエチレン-酢酸ビニル共重合体を粘着剤として用いた。上記均一混練物と上記粘着剤をTダイ法により共押出しすることによりポリオレフィン系の基材フィルム厚み60μm、エチレン-酢酸ビニル共重合体の粘着剤厚み10μmの表面保護フィルムを得た。

【0030】(評価項目および評価方法)上記で得られた表面保護フィルムの評価項目および評価法を以下に示す。また操作は全て室温23℃、湿度65%の恒温恒湿条件下で行った。

(初期抵抗値)上記で得られた表面保護フィルムを30

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分間放置後、ハイレジスタンスメーター（型式「4329A」、ヨコガワヒューレットパッカード（株）社製）を用いて基材の表面固有抵抗値（ Ω/\square ）を測定した結果を表1に示す。

【0031】（経時抵抗値）上記で得られた表面保護フィルムを原反形状で1週間放置した後、上記測定器を用いて基材の表面固有抵抗値（ Ω/\square ）を測定した結果を表1に示す。

【0032】（初期粘着力）上記で得られた表面保護フィルムを、厚さ2mmのポリカーボネート樹脂板（三菱瓦斯化学（株）社製、商品名「ユーピロンNF-2000」）に、2kgの圧着ローラーを用いて300mm/minの速度で貼付したものを30分間放置した後、JIS Z0237に準拠して25mm幅での180°ピ*

*ール粘着力を測定した結果を表1に示す。単位はg/25mmである。

【0033】（経時粘着力）上記で得られた表面保護フィルムを、原反形状で1週間放置した後、上記ポリカーボネート樹脂板に上記圧着ローラーを用いて貼付した後、JIS Z0237に準拠して25mm幅での180°ピール粘着力を測定した結果を表1に示す。単位はg/25mmである。

【0034】（表面外観変化）上記で得られた表面保護フィルムの表面における、面荒れ等の外観不良の有無を目視で観察した結果を表1に示す。

【0035】

【表1】

		実 施 例					比 較 例	
		1	2	3	4	5	1	2
基 材 層	ポリプロピレン	100	100	100	100	100	100	100
	ベレスタット	10	10	10	20	30	—	50
粘 着 剤 層	EVA-19	100	—	—	100	100	100	100
	EVA-28	—	100	—	—	—	—	—
	EVA-7	—	—	100	—	—	—	—
評 価 結 果	初 期 抵 抗 値	6.2×10^{13}	5.4×10^{13}	3.5×10^{13}	7.8×10^{11}	3.5×10^{10}	3.0×10^{10}	9.2×10^9
	経 時 抵 抗 値	4.8×10^{13}	7.8×10^{13}	6.6×10^{13}	8.7×10^{11}	4.8×10^{10}	5.8×10^{10}	8.3×10^9
	初 期 粘 着 力	11.2	123.6	4.3	11.4	11.0	10.9	11.5
	経 時 粘 着 力	10.9	116.4	5.1	11.1	10.7	11.3	11.6
	表面外観変化	無し	無し	無し	無し	無し	無し	面荒れ

【0036】

【表2】

		実 施 例					比 較 例	
		6	7	8	9	10	3	4
基 材 層	ポリプロピレン	100	100	100	100	100	100	100
	ポリエーテルアミ ドイミド樹脂	10	10	10	20	30	—	40
粘 着 剤 層	EVA-19	100	—	—	100	100	100	100
	EVA-28	—	100	—	—	—	—	—
	EVA-7	—	—	100	—	—	—	—
評 価 結 果	初期抵抗値	1.6×10^{13}	6.4×10^{13}	9.7×10^{12}	2.3×10^{12}	1.8×10^{11}	2.3×10^{14}	5.1×10^{10}
	経時抵抗値	3.2×10^{13}	4.2×10^{13}	7.5×10^{12}	8.9×10^{11}	4.8×10^{10}	4.7×10^{13}	8.2×10^9
	初期粘着力	11.5	131.2	5.3	10.2	11.0	12.1	11.8
	経時粘着力	12.2	135.1	4.7	11.8	11.6	10.8	12.3
	表面外観変化	無し	無し	無し	無し	無し	無し	面荒れ

【0037】

【発明の効果】本発明の樹脂板用表面保護フィルムの構成は上述の通りであり、初期だけでなく経時後においても帯電を抑えることができ、また粘着剤への悪影響がな

いので粘着力の経時変化や剥離後の被着体汚染もほとんどない為、特に合成樹脂板および複合合成樹脂板等の帯電し易い樹脂板の表面保護に好適に使用できる。

フロントページの続き

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(71)Applicant : SEKISUI CHEM CO LTD

(22)Date of filing : 31.03.1995

(72)Inventor: AGARI HIROSHI

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(54) SURFACE PROTECTIVE FILM FOR RESIN PLATE

(57)Abstract:

PURPOSE: To obtain a surface protective film for resin plate improved in antistatic properties by laminating a pressure-sensitive adhesive comprising an ethylene/vinyl acetate copolymer on a base film made of a thermoplastic polyolefin resin and a polyether resin having specified groups.

CONSTITUTION: 100 pts.wt. thermoplastic polyolefin resin (e.g. PP) is mixed with 5-30 pts.wt. amide or imide polyether resins having molecular weights of 5000-20000 [e.g. a polyether ester amide resin represented by formula I (j and k are each an integer of 1 or greater) and/or a polyether amide imide resin represented by formula II (m, n and p are each an integer of 1 or greater; and m/p is 3/7-7/3)] to form a uniform mixture. This mixture and a pressure-sensitive adhesive comprising an ethylene/vinyl acetate copolymer of a vinyl acetate content of 5-30wt.% are coextruded by e.g. the T die process to obtain a protective film used for a resin plate and composed of a polyolefin base film of a thickness of about 10-80μm and a pressure-sensitive adhesive layer of a thickness of about 5-30μm laminated thereon.

LEGAL STATUS

[Date of request for examination]

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CLAIMS

[Claim(s)]

[Claim 1] (A) The surface-protection film for resin plates characterized by carrying out the laminating of the binder with which a vinyl acetate content becomes one side of the base material film which becomes the polyolefine system thermoplastics 100 weight section and (B) intramolecular from the polyether system resin 5 - 30 weight sections which have an amide group and/or an imide radical from the ethylene-vinylacetate copolymer which is 5 - 30 % of the weight.

[Claim 2] The surface-protection film for resin plates according to claim 1 with which polyether system resin is characterized by being polyether ester amide resin or polyether amide imide resin.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the surface-protection film for resin plates.

[0002]

[Description of the Prior Art] The approach of carrying out temporary pasting of the surface-protection film which comes to carry out the laminating of the binder to one side of polyolefine system resin films, such as polyethylene and polypropylene, in order to prevent the dust to front faces, such as a synthetic-resin plate, a panel, and a metal plate, a pollution control called adhesion of dust, the breakage at the time of processing and haulage, etc. until now is learned.

[0003] However, after sticking the above-mentioned surface-protection film on a synthetic-resin plate, since both the above-mentioned surface-protection film and a synthetic-resin plate had high insulation, it was especially easy to wear static electricity by friction at the time of being conveyed or put on the bottom of desiccation ambient atmospheres, such as winter, consequently there was a trouble that workability fell not only by generating of electric shock or adsorption of dust but by attraction and repulsion of synthetic-resin plates.

[0004] As an approach of solving the above-mentioned trouble, the surface-protection film using the film which carried out addition mixing of the surfactant and which carried out postforming as a base material is indicated by for example, polyolefine system thermoplastics (JP,4-292943,A).

[0005]

[Problem(s) to be Solved by the Invention] However, even when a surface-protection film given [above-mentioned] in an official report is used, there was a trouble about aging of adhesive ability called the adherend contamination after the adhesion lowering by a surfactant carrying out bleed out of the antistatic nature which the amount of surfactants added has a limit, and the fully satisfied antistatic nature is not obtained, and is fully satisfied to a binder during a pasting activity if the method of profit and a lot of surfactants are added, or exfoliation.

[0006] The object of this invention is to offer the surface-protection film for resin plates which can be made to fully satisfy the prevention function of a synthetic-resin plate of electrification, and does not have aging of adhesive ability pasting in use.

[0007]

[Means for Solving the Problem] The base material film used for this invention consists of polyolefine system thermoplastics (A) and polyether system resin (B).

[0008] As the above-mentioned polyolefine system thermoplastics (A), a low-density-polyethylene, straight chain-like low-density-polyethylene, medium-density-polyethylene, high-density-polyethylene, and ethylene-alpha olefin copolymer, a propylene-alpha olefin copolymer, an ethylene-ethyl acrylate copolymer, an ethylene-vinylacetate copolymer, an ethylene-methyl methacrylate copolymer, polypropylene, etc. are mentioned, for example. These may be used independently, or two or more kinds may be mixed and they may be used.

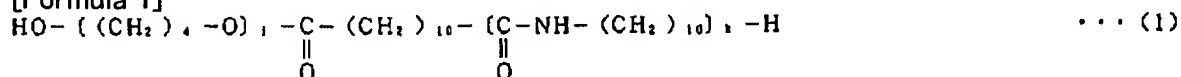
[0009] The above-mentioned polyether system resin (B) is polyether system resin which has an amide group and/or an imide radical in intramolecular, for example, polyether ester amide resin, polyether amide imide resin, etc. are mentioned.

[0010] Although it is guided to the both ends guided from the alkali-metal salt of epsilon

caprolactam and 3-isophthalic acid from the alkylene oxide addition product of bisphenols and is specifically expressed the polyamide which has a carboxyl group by them by the following general formula (1) as the above-mentioned polyether ester amide resin, others, those derivatives, etc. are mentioned.

[0011]

[Formula 1]

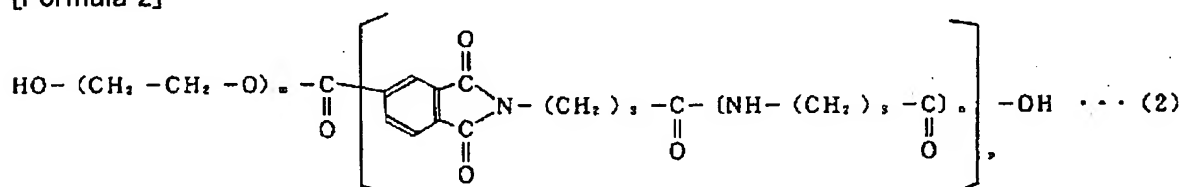


(j and k show one or more integers, respectively.)

[0012] As the above-mentioned polyether amide imide resin, a polyether is used as a principal chain, it is the compound which contains both an amide group and an imide radical in intramolecular, and although expressed with the following general formula (2), specifically, others, those derivatives, etc. are mentioned.

[0013]

[Formula 2]



(m, n, and p show one or more integers, respectively, and m:p is 3:7-7:3)

[0014] If the cohesive force of a sheet will be reduced if the weight average molecular weight of the above-mentioned polyether system resin (B) becomes small, and it becomes large, in order to spoil flexibility, 5,000-200,000 are desirable and are 10,000-100,000 more preferably.

[0015] If the addition of the above-mentioned polyether system resin (B) decreases, since it will become and it will say that only fixed antistatic nature is obtained even if it increases, but productivity becomes low that sufficient antistatic nature is hard to be obtained, it is 5 - 35 weight section to the above-mentioned polyolefine system (thermoplastics A) 100 weight section, and is 15 - 25 weight section preferably.

[0016] Although the indispensable component of the base material film used for this invention is as above-mentioned, light stabilizer, such as an ultraviolet ray absorbent, an antioxidant, a filler, etc. may be added if needed in addition to the above-mentioned indispensable component.

[0017] Although the thickness of the above-mentioned base material film is suitably chosen by the application, its 10-80 micrometers are desirable in respect of the ease of using.

[0018] The surface-protection film for resin plates of this invention is obtained by carrying out the laminating of the binder which becomes one side of the above-mentioned base material film from an ethylene-vinylacetate copolymer.

[0019] If it becomes easy to generate a float and peeling and they increase, without acquiring the adhesive property to the adherend of the above-mentioned surface-protection film for resin plates if it decreases, since removability with the adherend after an activity will become is hard to be obtained as for the vinyl acetate content in the above-mentioned ethylene-vinylacetate copolymer, it is 5 - 30 % of the weight, and is 10 - 20 % of the weight preferably.

[0020] A tackifier, a softener, an ultraviolet ray absorbent, an antioxidant, etc. may be added by the above-mentioned binder if needed.

[0021] Although the thickness of the above-mentioned binder is suitably chosen by the application, its 5-30 micrometers are desirable in respect of the ease of using.

[0022] Especially the manufacture approach of the surface-protection film for resin plates of this invention is not limited, may dry the solution of the above-mentioned binder after coating on the above-mentioned base material film which carried out extrusion molding after thermofusion, and may carry out package shaping of the constituent and the above-mentioned binder of the above-mentioned base material film by the two-layer co-extruding method using thermofusion

methods, such as a tubular film process and a T-die method.

[0023] The mixed resin which a polycarbonate resin plate, the acrylic resin plate, the vinyl-chloride-resin plate, the olefine resin plate, the ABS-plastics plate, etc. were mentioned, in addition carried out melting mixing of these, for example as a resin plate with which the surface-protection film of this invention is stuck suitably, or the compound resin which carried out the laminating to the multilayer is sufficient.

[0024]

[Function] The base material film used by this invention was excellent in antistatic nature, and since it is what carried out the amount content of specification of the polyether system resin which has the carbonyl group which originates in an amide group and/or an imide radical at intramolecular, when it is easy to configure the moisture in air in the unpaired electron pair of the oxygen atom of a carbonyl group and considers as the surface-protection film for resin plates, since polyolefine system thermoplastics has little bleed out to a binder, there has been no aging of adhesive ability in it. Moreover, since the binder which consists of an ethylene-vinylacetate copolymer is used, the adhesiveness over a synthetic-resin plate is good.

[0025]

[Example] The example of this invention is explained below. In addition, that it is with the "section" below means the "weight section."

(Examples 1-5 and examples 1-2 of a comparison) According to the combination presentation shown in a table 1, the homogeneity kneading object was first obtained to the polypropylene (Mitsubishi Kasei industrial company make, trade name "1501F") 100 section by adding the melting mixing resin (it considering as "PERESUTATTO" the Sanyo Chemical Industries, Ltd. make, a trade name "PERESUTATTO PP-3170", and the following) with which polyether ester amide resin was mixed with polypropylene by 70:30.

[0026] Moreover, the vinyl acetate content in an ethylene-vinylacetate copolymer is 19% of the weight of "EVA FLEX #460" (referred to as "EVA-19" a trade name, the Mitsui DEYUPON poly chemical company make, and the following), 28% of the weight of "EVA FLEX #280" (referred to as "EVA-28" a trade name, the Mitsui DEYUPON poly chemical company make, and the following) and 7% of the weight of "URUTORASEN 537" (referred to as "EVA-7" trade name, TOSOH [CORP.] CORP. make, and following) were used as a binder.

[0027] The surface-protection film with a base material film thickness [of a polyolefine system / of 60 micrometers] and a binder thickness [of an ethylene-vinylacetate copolymer] of 10 micrometers was obtained by carrying out the co-extrusion of the above-mentioned homogeneity kneading object and the above-mentioned binder by the T-die method.

[0028] (Examples 6-10 and examples 3-4 of a comparison) The homogeneity kneading object was obtained by carrying out melting mixing of the polyether amide imide resin (weight average molecular weight 50,000, m:p=5:5, n=5-15) first shown by polypropylene and the above-mentioned general formula (2) according to the combination presentation shown in a table 2.

[0029] Moreover, the ethylene-vinylacetate copolymer used in examples 1-5 and the examples 1-2 of a comparison was used as a binder. The surface-protection film with a base material film thickness [of a polyolefine system / of 60 micrometers] and a binder thickness [of an ethylene-vinylacetate copolymer] of 10 micrometers was obtained by carrying out the co-extrusion of the above-mentioned homogeneity kneading object and the above-mentioned binder by the T-die method.

[0030] [Evaluation criteria and the assessment approach] The evaluation criteria and the appraisal method of a surface-protection film which were obtained above are shown below. moreover, actuation — all — the room temperature of 23 degrees C, and the constant temperature of 65% of humidity — it carried out under constant humidity conditions.

(Initial resistance) The result of having measured the surface specific resistance value (omega/**) of a base material for the surface-protection film obtained above after neglect using high resistance meter (the "4329type A" YOKOGAWA Hewlett Packard [Co.] Co. make) for 30 minutes is shown in a table 1.

[0031] (Resistance with the passage of time) After leaving the surface-protection film obtained

specific resistance value (Ω/cm^2) of a base material using the above-mentioned measuring instrument is shown in a table 1.

[0032] (Initial adhesion) JIS after leaving for 30 minutes what used the 2kg sticking-by-pressure roller for the polycarbonate resin plate (the Mitsubishi Gas Chemical [Co., Inc.] Co., Inc. make, trade name "you pyrone NF-2000") with a thickness of 2mm, and stuck the surface-protection film obtained above on it at the rate of 300 mm/min The result of having measured 180-degree Peel adhesion in 25mm width of face based on Z0237 is shown in a table 1. A unit is g/25mm.

[0033] (Adhesion with the passage of time) JIS after using and sticking the above-mentioned sticking-by-pressure roller on the polycarbonate resin plate above-mentioned after leaving the surface-protection film obtained above for one week in an original fabric configuration The result of having measured 180-degree Peel adhesion in 25mm width of face based on Z0237 is shown in a table 1. A unit is g/25mm.

[0034] (Surface appearance change) The result of having observed visually the existence of a poor appearance, such as a field dry area in the front face of the surface-protection film obtained above, is shown in a table 1.

[0035]

[A table 1]

		実 施 例					比 較 例	
		1	2	3	4	5	1	2
基 材 層	ポリプロピレン	100	100	100	100	100	100	100
	ベレスタット	10	10	10	20	30	—	50
粘 着 剤 層	E V A - 1 9	100	—	—	100	100	100	100
	E V A - 2 8	—	100	—	—	—	—	—
	E V A - 7	—	—	100	—	—	—	—
評 価 結 果	初 期 抵 抗 値	6.2×10^{13}	5.4×10^{13}	3.5×10^{13}	7.8×10^{11}	3.5×10^{10}	3.0×10^{13}	9.2×10^9
	経 時 抵 抗 値	4.8×10^{13}	7.8×10^{13}	6.6×10^{13}	8.7×10^{11}	4.8×10^{10}	5.8×10^{13}	8.3×10^9
	初 期 粘 着 力	11.2	123.6	4.3	11.4	11.0	10.9	11.5
	経 時 粘 着 力	10.9	116.4	5.1	11.1	10.7	11.3	11.6
	表面外観変化	無し	無し	無し	無し	無し	無し	面荒れ

[0036]

[A table 2]

		実 施 例					比 較 例	
		6	7	8	9	10	3	4
基 材 層	ポリプロピレン	100	100	100	100	100	100	100
	ポリエーテルアミ ドイミド樹脂	10	10	10	20	30	—	40
粘 着 剤 層	E V A - 1 9	100	—	—	100	100	100	100
	E V A - 2 8	—	100	—	—	—	—	—
	E V A - 7	—	—	100	—	—	—	—
評 価 結 果	初期抵抗値	1.6×10^{13}	6.4×10^{13}	9.7×10^{12}	2.3×10^{12}	1.8×10^{11}	2.3×10^{15}	5.1×10^{10}
	経時抵抗値	3.2×10^{13}	4.2×10^{13}	7.5×10^{13}	8.9×10^{11}	4.8×10^{10}	4.7×10^{15}	8.2×10^9
	初期粘着力	11.5	131.2	5.3	10.2	11.0	12.1	11.8
	経時粘着力	12.2	135.1	4.7	11.8	11.6	10.8	12.3
	表面外観変化	無し	無し	無し	無し	無し	無し	面荒れ

[0037]

[Effect of the Invention] The configuration of the surface-protection film for resin plates of this invention is as above-mentioned, and since electrification can be suppressed not only the first stage but after the passage of time, and there is no adverse effect to a binder and there is also almost no adherend contamination after aging of adhesion or exfoliation, it can be used especially suitable for the surface protection of resin plates which are easy to be charged, such as a synthetic-resin plate and a compound synthetic-resin plate.

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TECHNICAL FIELD

[Industrial Application] This invention relates to the surface-protection film for resin plates.

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PRIOR ART

[Description of the Prior Art] The approach of carrying out temporary pasting of the surface-protection film which comes to carry out the laminating of the binder to one side of polyolefine system resin films, such as polyethylene and polypropylene, in order to prevent the dust to front faces, such as a synthetic-resin plate, a panel, and a metal plate, a pollution control called adhesion of dust, the breakage at the time of processing and haulage, etc. until now is learned.

[0003] However, after sticking the above-mentioned surface-protection film on a synthetic-resin plate, since both the above-mentioned surface-protection film and a synthetic-resin plate had high insulation, it was especially easy to wear static electricity by friction at the time of being conveyed or put on the bottom of desiccation ambient atmospheres, such as winter, consequently there was a trouble that workability fell not only by generating of electric shock or adsorption of dust but by attraction and repulsion of synthetic-resin plates.

[0004] As an approach of solving the above-mentioned trouble, the surface-protection film using the film which carried out addition mixing of the surfactant and which carried out postforming as a base material is indicated by for example, polyolefine system thermoplastics (JP,4-292943,A).

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EFFECT OF THE INVENTION

[Effect of the Invention] The configuration of the surface-protection film for resin plates of this invention is as above-mentioned, and since electrification can be suppressed not only the first stage but after the passage of time, and there is no adverse effect to a binder and there is also almost no adherend contamination after aging of adhesion or exfoliation, it can be used especially suitable for the surface protection of resin plates which are easy to be charged, such as a synthetic-resin plate and a compound synthetic-resin plate.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, even when a surface-protection film given [above-mentioned] in an official report is used, there was a trouble about aging of adhesive ability called the adherend contamination after the adhesion lowering by a surfactant carrying out bleed out of the antistatic nature which the amount of surfactants added has a limit, and the fully satisfied antistatic nature is not obtained, and is fully satisfied to a binder during a pasting activity if the method of profit and a lot of surfactants are added, or exfoliation.

[0006] The object of this invention is to offer the surface-protection film for resin plates which can be made to fully satisfy the prevention function of a synthetic-resin plate of electrification; and does not have aging of adhesive ability pasting in use.

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MEANS

[Means for Solving the Problem] The base material film used for this invention consists of polyolefine system thermoplastics (A) and polyether system resin (B).

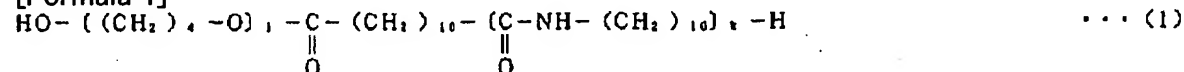
[0008] As the above-mentioned polyolefine system thermoplastics (A), a low-density-polyethylene, straight chain-like low-density-polyethylene, medium-density-polyethylene, high-density-polyethylene, and ethylene-alpha olefin copolymer, a propylene-alpha olefin copolymer, an ethylene-ethyl acrylate copolymer, an ethylene-vinylacetate copolymer, an ethylene-methyl methacrylate copolymer, polypropylene, etc. are mentioned, for example. These may be used independently, or two or more kinds may be mixed and they may be used.

[0009] The above-mentioned polyether system resin (B) is polyether system resin which has an amide group and/or an imide radical in intramolecular, for example, polyether ester amide resin, polyether amide imide resin, etc. are mentioned.

[0010] Although it is guided to the both ends guided from the alkali-metal salt of epsilon caprolactam and 3-isophthalic acid from the alkylene oxide addition product of bisphenols and is specifically expressed the polyamide which has a carboxyl group by them by the following general formula (1) as the above-mentioned polyether ester amide resin, others, those derivatives, etc. are mentioned.

[0011]

[Formula 1]

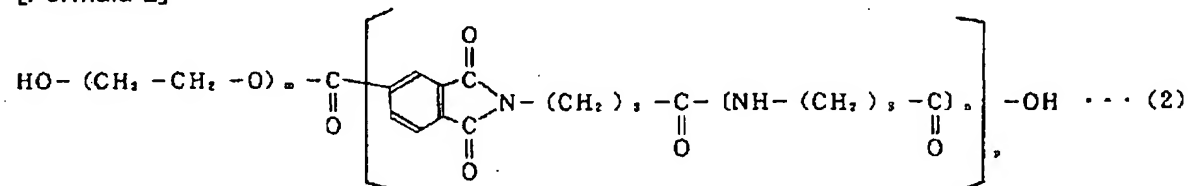


(j and k show one or more integers, respectively.)

[0012] As the above-mentioned polyether amide imide resin, a polyether is used as a principal chain, it is the compound which contains both an amide group and an imide radical in intramolecular, and although expressed with the following general formula (2), specifically, others, those derivatives, etc. are mentioned.

[0013]

[Formula 2]



(m, n, and p show one or more integers, respectively, and m:p is 3:7-7:3)

[0014] If the cohesive force of a sheet will be reduced if the weight average molecular weight of the above-mentioned polyether system resin (B) becomes small, and it becomes large, in order to spoil flexibility, 5,000-200,000 are desirable and are 10,000-100,000 more preferably.

[0015] If the addition of the above-mentioned polyether system resin (B) decreases, since it will become and it will say that only fixed antistatic nature is obtained even if it increases, but

productivity becomes low that sufficient antistatic nature is hard to be obtained, it is 5 - 35 weight section to the above-mentioned polyolefine system (thermoplastics A) 100 weight section, and is 15 - 25 weight section preferably.

[0016] Although the indispensable component of the base material film used for this invention is as above-mentioned, light stabilizer, such as an ultraviolet ray absorbent, an antioxidant, a filler, etc. may be added if needed in addition to the above-mentioned indispensable component.

[0017] Although the thickness of the above-mentioned base material film is suitably chosen by the application, its 10-80 micrometers are desirable in respect of the ease of using.

[0018] The surface-protection film for resin plates of this invention is obtained by carrying out the laminating of the binder which becomes one side of the above-mentioned base material film from an ethylene-vinylacetate copolymer.

[0019] If it becomes easy to generate a float and peeling and they increase, without acquiring the adhesive property to the adherend of the above-mentioned surface-protection film for resin plates if it decreases, since removability with the adherend after an activity will become is hard to be obtained as for the vinyl acetate content in the above-mentioned ethylene-vinylacetate copolymer, it is 5 - 30 % of the weight, and is 10 - 20 % of the weight preferably.

[0020] A tackifier, a softener, an ultraviolet ray absorbent, an antioxidant, etc. may be added by the above-mentioned binder if needed.

[0021] Although the thickness of the above-mentioned binder is suitably chosen by the application, its 5-30 micrometers are desirable in respect of the ease of using.

[0022] Especially the manufacture approach of the surface-protection film for resin plates of this invention is not limited, may dry the solution of the above-mentioned binder after coating on the above-mentioned base material film which carried out extrusion molding after thermofusion, and may carry out package shaping of the constituent and the above-mentioned binder of the above-mentioned base material film by the two-layer co-extruding method using thermofusion methods, such as a tubular film process and a T-die method.

[0023] The mixed resin which a polycarbonate resin plate, the acrylic resin plate, the vinyl-chloride-resin plate, the olefine resin plate, the ABS-plastics plate, etc. were mentioned, in addition carried out melting mixing of these, for example as a resin plate with which the surface-protection film of this invention is stuck suitably, or the compound resin which carried out the laminating to the multilayer is sufficient.

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OPERATION

[Function] The base material film used by this invention was excellent in antistatic nature, and since it is what carried out the amount content of specification of the polyether system resin which has the carbonyl group which originates in an amide group and/or an imide radical at intramolecular, when it is easy to configurate the moisture in air in the unpaired electron pair of the oxygen atom of a carbonyl group and considers as the surface-protection film for resin plates, since polyolefine system thermoplastics has little bleed out to a binder, there has been no aging of adhesive ability in it. Moreover, since the binder which consists of an ethylene-vinylacetate copolymer is used, the adhesiveness over a synthetic-resin plate is good.

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EXAMPLE

[Example] The example of this invention is explained below. In addition, that it is with the "section" below means the "weight section."

(Examples 1-5 and examples 1-2 of a comparison) According to the combination presentation shown in a table 1, the homogeneity kneading object was first obtained to the polypropylene (Mitsubishi Kasei industrial company make, trade name "1501F") 100 section by adding the melting mixing resin (it considering as "PERESUTATTO" the Sanyo Chemical Industries, Ltd. make, a trade name "PERESUTATTO PP-3170", and the following) with which polyether ester amide resin was mixed with polypropylene by 70:30.

[0026] Moreover, the vinyl acetate content in an ethylene-vinylacetate copolymer is 19% of the weight of "EVA FLEX #460" (referred to as "EVA-19" a trade name, the Mitsui DEYUPON poly chemical company make, and the following), 28% of the weight of "EVA FLEX #280" (referred to as "EVA-28" a trade name, the Mitsui DEYUPON poly chemical company make, and the following) and 7% of the weight of "URUTORASEN 537" (referred to as "EVA-7" trade name, TOSOH [CORP.] CORP. make, and following) were used as a binder.

[0027] The surface-protection film with a base material film thickness [of a polyolefine system / of 60 micrometers] and a binder thickness [of an ethylene-vinylacetate copolymer] of 10 micrometers was obtained by carrying out the co-extrusion of the above-mentioned homogeneity kneading object and the above-mentioned binder by the T-die method.

[0028] (Examples 6-10 and examples 3-4 of a comparison) The homogeneity kneading object was obtained by carrying out melting mixing of the polyether amide imide resin (weight average molecular weight 50,000, m:p=5:5, n=5-15) first shown by polypropylene and the above-mentioned general formula (2) according to the combination presentation shown in a table 2.

[0029] Moreover, the ethylene-vinylacetate copolymer used in examples 1-5 and the examples 1-2 of a comparison was used as a binder. The surface-protection film with a base material film thickness [of a polyolefine system / of 60 micrometers] and a binder thickness [of an ethylene-vinylacetate copolymer] of 10 micrometers was obtained by carrying out the co-extrusion of the above-mentioned homogeneity kneading object and the above-mentioned binder by the T-die method.

[0030] [Evaluation criteria and the assessment approach] The evaluation criteria and the appraisal method of a surface-protection film which were obtained above are shown below. moreover, actuation — all — the room temperature of 23 degrees C, and the constant temperature of 65% of humidity — it carried out under constant humidity conditions.

(Initial resistance) The result of having measured the surface specific resistance value (ω/Ω) of a base material for the surface-protection film obtained above after neglect using high resistance meter (the "4329type A" YOKOGAWA Hewlett Packard [Co.] Co. make) for 30 minutes is shown in a table 1.

[0031] (Resistance with the passage of time) After leaving the surface-protection film obtained above for one week in an original fabric configuration, the result of having measured the surface specific resistance value (ω/Ω) of a base material using the above-mentioned measuring instrument is shown in a table 1.

[0032] (Initial adhesion) after leaving for 30 minutes what used the 2kg sticking-by-pressure

roller for the polycarbonate resin plate (the Mitsubishi Gas Chemical [Co., Inc.] Co., Inc. make, trade name "you pyrone NF-2000") with a thickness of 2mm, and stuck the surface-protection film obtained above on it at the rate of 300 mm/min The result of having measured 180-degree Peel adhesion in 25mm width of face based on Z0237 is shown in a table 1. A unit is g/25mm.

[0033] (Adhesion with the passage of time) JIS after using and sticking the above-mentioned sticking-by-pressure roller on the polycarbonate resin plate above-mentioned after leaving the surface-protection film obtained above for one week in an original fabric configuration The result of having measured 180-degree Peel adhesion in 25mm width of face based on Z0237 is shown in a table 1. A unit is g/25mm.

[0034] (Surface appearance change) The result of having observed visually the existence of a poor appearance, such as a field dry area in the front face of the surface-protection film obtained above, is shown in a table 1.

[0035]

[A table 1]

		実 施 例					比 較 例	
		1	2	3	4	5	1	2
基 材 層	ポリプロピレン	100	100	100	100	100	100	100
	ベレスタット	10	10	10	20	30	—	50
粘 着 剤 層	E V A - 1 9	100	—	—	100	100	100	100
	E V A - 2 8	—	100	—	—	—	—	—
	E V A - 7	—	—	100	—	—	—	—
評 価 結 果	初 期 抵 抗 値	6.2×10^{13}	5.4×10^{13}	3.5×10^{13}	7.8×10^{11}	3.5×10^{10}	3.0×10^{10}	9.2×10^4
	経 時 抵 抗 値	4.8×10^{13}	7.8×10^{13}	6.6×10^{13}	8.7×10^{11}	4.8×10^{10}	5.8×10^{10}	8.3×10^4
	初 期 粘 着 力	11.2	123.6	4.3	11.4	11.0	10.9	11.5
	経 時 粘 着 力	10.9	116.4	5.1	11.1	10.7	11.3	11.6
	表面外観変化	無し	無し	無し	無し	無し	無し	面荒れ

[0036]

[A table 2]

		実 施 例					比 較 例	
		6	7	8	9	10	3	4
基 材 層	ポリプロピレン	100	100	100	100	100	100	100
	ポリエーテルアミ ドイミド樹脂	10	10	10	20	30	—	40
粘 着 剤 層	E V A - 1 9	100	—	—	100	100	100	100
	E V A - 2 8	—	100	—	—	—	—	—
	E V A - 7	—	—	100	—	—	—	—
評 価 結 果	初 期 抵 抗 値	1.6×10^{13}	6.4×10^{13}	9.7×10^{12}	2.3×10^{13}	1.8×10^{11}	2.3×10^{18}	5.1×10^{10}
	経 時 抵 抗 値	3.2×10^{13}	4.2×10^{13}	7.5×10^{13}	8.9×10^{11}	4.8×10^{10}	4.7×10^{18}	8.2×10^9
	初 期 粘 着 力	11.5	131.2	5.3	10.2	11.0	12.1	11.8
	経 時 粘 着 力	12.2	135.1	4.7	11.8	11.6	10.8	12.3
	表面外観変化	無し	無し	無し	無し	無し	無し	面荒れ

[Translation done.]